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***COST OF STORING***

**SEED COTTON**

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## SUMMARY AND CONCLUSIONS

The trend in recent years to the use of mechanical harvesting equipment in much of the Cotton Belt has shortened the cotton harvesting season to only a few weeks. Seed cotton flows to gins at such a rate that many plants cannot handle it all at the peak of the season. This, in turn, delays the return of emptied trailers to the field and thus can delay the harvest. For most gins, providing some type of seed-cotton storage system or increasing the ginning capacity is a feasible alternative for increasing their unloading rate.

Studies have shown that relatively dry seed cotton can be stored for extended periods without harmful effects. However, prolonged storage in old-style houses with individual bins, or on trailers would be exorbitantly expensive. Hence, the most feasible means of storing seed cotton in sufficient volume to appreciably increase the unloading rate, and extend the ginning season, appears to be portable baskets or bulk storage.

Objectives of this study were (1) to determine costs of establishing and operating 3 specific types of seed-cotton storage facilities; (2) to analyze the effects of seed-cotton storage operations on the overall costs of ginning firms; and (3) to compare the costs of increasing gin handling capacity by providing seed-cotton storage with the costs of increasing the rate of ginning by building new plants or modernizing existing plants. Data for this study were obtained from 9 gin firms with seed-cotton storage facilities located in 3 major regions of the Cotton Belt.

For many ginners, storing seed cotton in portable baskets, although more costly, appears to be the most practicable of the 3 methods studied. This method will require an investment of approximately \$34,100 for storage of 500-bale capacity; for 5,000 bales it will require an investment of about \$219,400.

If gin-yard bulk storage can be used, a 500-bale unit will require an investment of about \$24,150, whereas for a 5,000-bale facility the cost will approximate \$173,500. Farm bulk storage can be provided at approximately 55 to 60 percent of these costs if open-sided, all-steel sheds are used.

Under present conditions, it is unlikely that storage facilities can be used more than one time during the season. If used to full capacity, a conservative estimate of the costs per bale for storage in portable baskets ranges from about \$7.50 per bale for a 500-bale unit to approximately \$5 per bale for a 5,000-bale storage facility. When bulk storage can be used, the estimated costs per bale will be from 20 to 25 percent less. Costs of storing seed cotton in bulk can be further reduced, if the structures are already available or can be used for some alternative purpose during the off-season.

If seed-cotton storage facilities are provided on a gin yard, the fixed and the variable costs of storing seed cotton must be added to the cost of ginning to derive the total cost to the firm. The probable increase in seasonal ginning volume resulting from storage will reduce the fixed ginning cost per bale, and may also slightly reduce variable ginning cost per bale. However, the cost of storing is likely to more than offset the reduction in ginning costs. For example, the average per bale cost for a small plant (rated at 8 bales an hour) with a seasonal volume of 6,000 bales attainable without storage was

\$13.47. Providing and using portable basket seed-cotton storage of 1,000-bale capacity, and thus increasing maximum seasonal volume to 7,000 bales, increases per bale cost to \$13.67. If this storage capacity is provided but because of a short crop is not used, average cost per bale rises to \$14.32 for a seasonal volume of 6,000 bales.

Thus, the decision to incorporate storage facilities with a ginning operation should be based on a thorough appraisal of both immediate and long-run prospects for potential volume.

Providing seed-cotton storage facilities at medium- and large-size plants (rated at 12 and 16 bales an hour, respectively) increases total and per bale costs for all levels of seasonal volume similar to the increase for the small plant.

For a seasonal volume of 7,000 bales, the per bale cost of storing and ginning for the small plant with 1,000 bales of seed-cotton storage is identical with the per bale cost of ginning for the medium-size plant without storage. If portable basket storage of 2,000-bale capacity is added at the small gin, providing a maximum seasonal volume of 8,000 bales, storing and ginning costs will exceed ginning costs of the medium-size gin without storage at all applicable levels of seasonal volume. Likewise, for all applicable outputs a 3,000-bale or larger storage facility added at the small plant will result in a storing and ginning cost that is higher than the ginning cost for the large plant without storage.

Thus, it appears that adding up to 1,000 bales of storage capacity at the small gin can be justified only if the anticipated seasonal volume is not expected to exceed 7,000 bales. If prospects are good for greater volumes, consideration should be given to increasing the ginning rate, either by modernizing the gin, adding an additional gin, or replacing the existing gin with one of greater hourly capacity.

An estimate of per annum costs for depreciation, interest on investment, plant insurance, and taxes is approximately 9 cents per dollar invested in new ginning capacity. Dividing the annual fixed costs of storing seed cotton by this cost factor provides a guide in determining whether to increase capacity by plant modernization or by extending the ginning season through the use of seed-cotton storage facilities.

For example, annual fixed cost of storing 1,000 bales in portable baskets averaged \$5,110. Dividing this sum by \$0.09 gives \$56,778. Hence, a ginner can invest this sum in gin modernization or replacement to increase ginning capacity by 1,000 bales as economically as he can make provisions to store this much seed cotton. If this increase in ginning capacity can be attained at an expenditure of less than \$56,778, storage cannot be justified. However, if an expenditure of more than \$56,778 is required to attain the increased ginning capacity, seed-cotton storage will be preferable. Similar computations can be made for other volume levels to be considered.

In addition, annual variable costs associated with storing seed cotton must be compared with possible increases in variable costs resulting from plant modernization; and their effects on total cost to the firm must be carefully considered.

## COST OF STORING SEED COTTON

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### INTRODUCTION

Increased use of mechanical pickers and strippers in recent years has resulted in accumulations of large backlogs of seed cotton on many gin yards during peak periods of the harvesting season. This is particularly true in the Far West, the Texas High Plains, and the Midsouth production areas. During favorable weather, cotton producers make every effort to harvest their cotton as rapidly as possible following maturity. Thus, as the season progresses, ginners are subjected to continually mounting pressure by growers to unload their trailers more rapidly so that they can be returned to the field. However, many ginners are already operating their gins at optimum rates compatible with the preservation of fiber quality.

It can be argued that producers should purchase more trailers in order to handle a larger percentage of their crop at any one time. However, in many areas, competition among gins for greater volume is so pronounced that few ginners can afford to take this attitude. Also, storage on producers' trailers for extended periods is exorbitantly expensive.

Confronted with this dilemma, some ginning firms have increased their unloading and handling capacities by (1) providing facilities for storing seed cotton on the gin premises, (2) increasing their ginning rate either by constructing new plants of greater capacity, or by modernizing existing plants, or (3) adopting some combination of these methods.

As a result, these firms have more nearly matched their unloading rates with the combined harvesting rates of their customers, and hence have helped expedite the return of empty trailers to the field. In this way, ginners have not only been able to more nearly satisfy their ginning patrons; they have been able to do a more acceptable job of preserving lint quality. In a few instances, some ginning firms have also increased seasonal volume because they were able to provide more timely service than that of their competitors. In other cases, because of unfavorable prospects for volume, some firms have discontinued operations.

Many other gin operators are still undecided as to the best solutions for their particular problems. In many cases, investment in present gin plants exceeds a quarter of a million dollars. Management is hesitant to make large

outlays of capital to increase the rate of ginning because of the uncertainty as to future ginning volumes and competitors' plans for increasing their unloading rates. Thus, many firms have become increasingly interested in the cost of providing and operating seed-cotton storage facilities in conjunction with their ginning operation.

Research conducted in the early 1950's revealed that a 100-bale seed-cotton storage house with bins and handling equipment required an investment of about \$16,000. 1/ Another study during the 1950's found that the cost of storing seed cotton at 2 Mississippi gins ranged from \$5.87 a bale for concrete houses used 3 times during the season to \$9.03 a bale for wooden houses used only once; and at three California gins, costs ranged from \$6.10 a bale for a rack system used  $2\frac{1}{2}$  times annually, to \$8.35 a bale for a concrete house used only once. 2/

In the past decade, however, harvesting practices and the relative costs of construction materials, labor, power, and gin machinery have changed considerably. Also, technological developments in ginning and materials handling and recently introduced innovations in storage operations may have significantly changed the relative costs of storing seed cotton compared with the cost of constructing new gins or remodeling existing gins. Therefore, there is a need for current information on combined costs of alternative storing-ginning operations as an aid in solving problems related to volume, costs, quality, and satisfied gin customers.

#### OBJECTIVES AND METHOD OF STUDY

In 1963, the U.S. Department of Agriculture initiated research to (1) determine costs of establishing and operating 3 specific types of seed-cotton storage facilities, (2) analyze effects of seed-cotton storage operations on overall costs of ginning firms, and (3) compare the costs of increasing gin handling capacity by providing seed-cotton storage with the costs of increasing the rate of ginning by building new plants or modernizing existing plants.

Three major geographical areas of production--the Midsouth, the Texas High Plains, and the San Joaquin Valley of California--were selected for study. Detailed data on investments in storage facilities and annual costs of storing and ginning for 1962 were obtained from 3 gin firms in each area; these represented a substantial portion of ginning firms in the Cotton Belt using seed-cotton storage facilities at that time. Investment costs for constructing new plants and modernizing existing plants were available from other closely related current research on ginning.

These data were used as a basis for estimating investment costs of storage facilities and effects of storing seed cotton on the total cost of the ginning firm, for developing cost estimates of alternatives to seed-cotton storage, and for appraising the cost of possible solutions to prevalent storing-ginning problems in major areas of production.

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1/ Looney, Zolon M. and Speakes, Charles C. Conditioning and Storage of Seed Cotton with Special Reference to Mechanically Harvested Cotton. Prod. and Mktg. Adm. and Agr. Res. Adm., U.S. Dept. Agr., March 1952. (Mimeo.)

2/ Ross, John E., Jr. Some Economic Considerations in Storing Seed Cotton at Gins, Agr. Mktg. Ser., U.S. Dept. Agr. Mktg. Res. Rpt. No. 87, April 1955.

## INVESTMENT COSTS FOR SEED-COTTON STORAGE FACILITIES

There are a number of systems of seed-cotton storage that are presently in use and might be considered by ginners. Basically, however, they may be divided into 3 groups: (1) Portable basket storage on gin yard, (2) bulk storage on gin yard, and (3) bulk storage on farm. The feasibility of storing seed cotton in baled packages has also been considered but not fully explored. 3/

### Portable Basket Storage

A system of storage becoming increasingly popular consists of portable baskets which are placed in racks or on the ground, a hydraulic lift mover and tractor, and an unloading station. Some unloading stations are equipped only to transfer cotton from trailer to basket. Others may be equipped to dry and clean as well as unload cotton. If the unloading station includes drying and cleaning facilities, it may be viewed by the ginner as an aid to more efficient ginning and quality improvement rather than as a storage operation. However, the storage capacity can be increased by providing more baskets. Flexibility is the main advantage of this type of storage. No lot of individually owned cotton is too small or too large to be stored, if a sufficient number of baskets are available. This is not true of the bulk-type storage facilities that are currently being used.

The capital investment required to provide such a system varies over a wide range, and depends primarily on the capacity desired. An unloading station--including a fan and other necessary unloading equipment, hydraulically operated mover, tractor, shed, land, and 50 all-steel, 10-bale baskets--can be installed for approximately \$34,100 (table 1; all tables are in the appendix beginning on page 14). An additional outlay of \$13,700 for baskets and \$8,300 for sheds and land will provide another 500 bales of capacity, making a total investment of about \$56,100 for a 1,000-bale system. Storage capacity for 5,000 bales will require an investment of about \$219,400.

### Bulk Storage on Gin Yard

Storing seed cotton in bulk has long been accepted as safe so long as moisture content is at a relatively low level. However, providing fixed storage facilities with individual bins is too expensive and cumbersome for most ginners to consider, especially if they have a large number of customers.

If both seed cotton and gin are owned by the same person or firm, bulk storage on the gin premises may be a feasible alternative to providing additional ginning facilities. It may also be a practical solution when only a few large growers own or patronize a gin. This would be true especially if the rate of harvest exceeds the gin capacity only for a short time.

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3/ Garner, Warren E. Effect of Seed Cotton Storage on Quality of Cotton-seed and Lint at the Gin. Carolinas Ginners Ann. Rev., Vol. IV. No. 1, July 1963.

Care should be taken, however, in laying out the system, so that seed cotton can be moved from storage to the gin in quantities that will maintain an efficient rate of ginning. Otherwise, the increased cost of ginning such cotton could more than offset any benefits derived from the storage operation. The facility should be designed so that it may be used for other purposes during the time it is not used for storage. Depreciation and interest on investment are major items of total cost, and they can be greatly reduced if a greater part can be allocated to some other operation.

A 500-bale-capacity, all-steel building with concrete floor will cost approximately \$13,750, and a 1,000-bale facility about \$25,000 (table 3). Separator, motors, fans, necessary piping, and land will add about \$10,400 to the cost of the 500-bale facility for a total investment of \$24,150. Total investment for a 5,000-bale facility will approximate \$173,500.

### Bulk Storage on Farm

Growers operating large acreages may find that on-farm storage offers some advantages. This is especially true if a multiple-purpose shelter can be profitably used during the time it is not needed for cotton storage, or if old buildings are already available, or if reduced rates for ginning stored seed cotton can be obtained by allowing the ginner to process such cotton when his plant would be idle otherwise. Providing such storage can assure the grower that harvesters are kept busy during favorable weather when cotton is ready for harvest, thereby reducing field losses in grade. These savings may more than offset the cost of storing seed cotton which cannot be ginned immediately.

Portable unloading devices consisting of a fan and piping mounted on a 2-wheel trailer are available at reasonable cost. Shop-built unloaders can sometimes be assembled from components already on hand or readily available at a cost of about \$1,175 (table 4). Needed power can be supplied by a standard farm tractor, which is available on most farms at harvest time.

An all-steel, open-sided shed with dirt floor, 180 feet long, 60 feet wide and 12 feet high, with a capacity of 500 bales, can be constructed for approximately \$11,360. When used for storing seed cotton, the sides can be enclosed with wire mesh and the ground covered with plastic sheets at reasonable cost. Such a shed, when not in use for storing seed cotton, offers a convenient place for sheltering combines, cotton pickers, hay balers, and other implements subject to heavy weather damage.

This type of facility with storage for 500 bales would require a total capital investment of about \$12,635. Storage of this type for 5,000 bales can be provided for about \$96,500. By prorating annual fixed costs on the basis of proportion of time used for different purposes, costs of storing seed cotton on the farm can be reduced significantly. However, possibilities of profitably utilizing extensive storage facilities of this type for alternate purposes will be limited on many farms.

## COST PER BALE FOR STORING SEED COTTON

If seed cotton is stored primarily to extend the season and thus eliminate the necessity of replacing an older plant with one of higher capacity, storage facilities could be filled only once during the season. Variations in length of time seed cotton is stored will affect only one variable cost item--cotton insurance. No allowance was made for this item in the cost calculations that follow because of wide variations in types of coverage and rates in different areas. However, this cost will have to be considered by any ginner or producer contemplating installation of seed-cotton storage facilities.

Cost estimates on storing seed cotton in portable baskets were higher than for the other two types of storage. These costs of storage per bale in portable baskets in the Midsouth ranged from \$7.30 for 500 bales to \$4.83 for 5,000 bales (table 5). In the High Plains, estimated costs of storage in baskets for these capacities ranged from \$7.33 to \$4.84 per bale. In the San Joaquin Valley, estimates ranged from \$7.97 to \$5.29. Higher tax and wage rates largely accounted for the higher cost in the latter area.

Cost estimates per bale for bulk storage on the gin yard in the Midsouth ranged from \$5.54 for 500 bales to \$4.24 for 5,000 bales (table 6). The ranges for these capacities were \$5.50 to \$4.19 per bale in the High Plains, and \$6.15 to \$4.73 per bale in the San Joaquin Valley. If this type of storage facility could be used profitably for some alternative purpose when not filled with seed cotton, it is possible that up to 75 percent of the fixed costs could be charged to alternative uses. This would reduce costs of storing seed cotton by as much as \$2 to \$3 per bale. Costs of bulk storage on the gin yard could also be reduced by using open-sided facilities enclosed with wire mesh. If 3,000 to 5,000 bales are to be stored, the use of portable unloading equipment would result in further cost reductions.

Calculated costs of bulk storage on the farm in the Midsouth were \$5.15 and \$4.84 per bale for 500- and 1,000-bale capacities, respectively (table 2). If capacities were increased, or if there were profitable alternative uses for these facilities, costs could be reduced substantially.

### EFFECTS OF STORING SEED COTTON ON TOTAL COSTS OF FIRM

Costs of storing seed cotton on the gin yard must be added to ginning costs to determine total costs of the ginning firm. The increased seasonal ginning volume resulting from storage will reduce fixed ginning costs per bale; and because of the possibility of more efficient use of labor and other variable inputs, operating costs per bale for ginning may also be slightly reduced. Thus, from the standpoint of ginning costs alone, increased volume resulting from seed-cotton storage is advantageous. However, costs of storing seed cotton to provide the increased seasonal volume may more than offset the decline in per bale ginning cost. Hence, the net effect of these opposing forces on total cost must be considered in evaluating the economic feasibility of incorporating seed-cotton storage facilities with a ginning operation.

Because of variations among ginning firms in hourly ginning capacity, potential seasonal volume, length of harvesting season, age and initial investment costs of gin plants, and operating practices, it was not possible to develop costs which were applicable to specific firms--even for those in the same community. However, the effect of providing portable basket gin-yard storage on total cost was estimated for 3 typical ginning firms with rated capacities of 8, 12, and 16 bales an hour, hereafter referred to as small, medium, and large plants, respectively.<sup>4/</sup>

The first step in deriving these estimates was to determine the costs of ginning for different assumed seasonal volumes. Second, costs of storing different volumes of seed cotton were incorporated with ginning costs to determine total cost of the firm's storing-ginning operation.

### Ginning Costs for Typical Firms

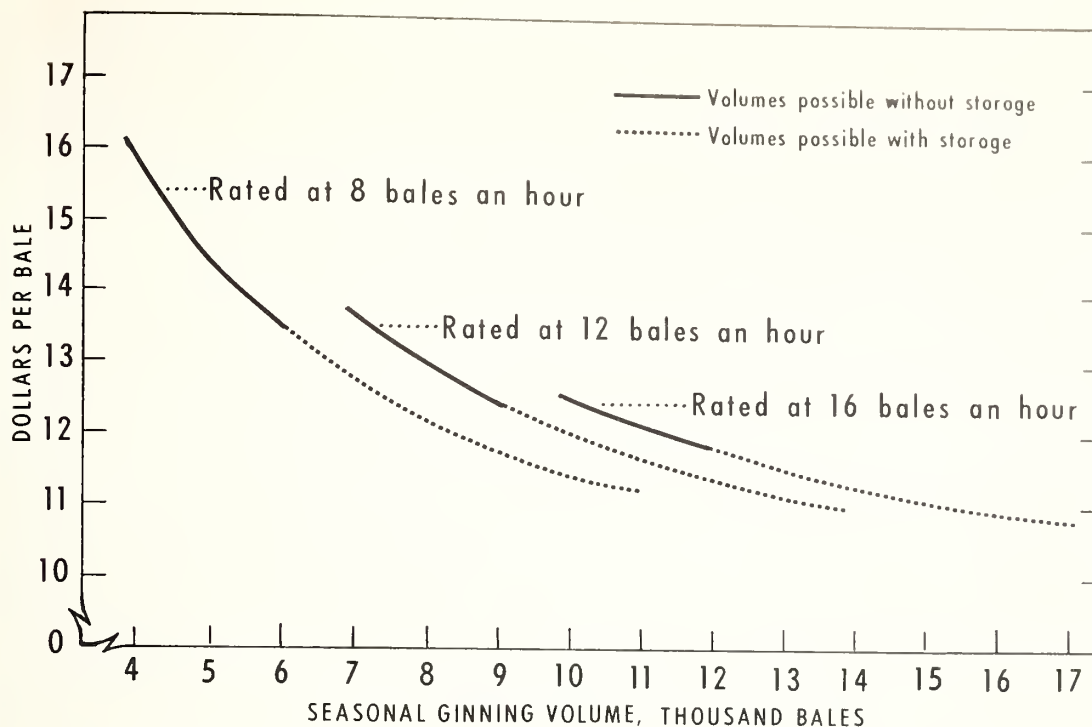
Because most firms can seldom operate at their rated capacities for the entire season, the seasonal average operating capacities for small, medium, and large plants were estimated at 7.0, 10.2, and 13.6 bales an hour, respectively. It was assumed that the normal ginning season for these firms, which closely corresponds with the length of the harvesting season, would total approximately 860 hours. Thus, based on average operating capacities, the small, medium, and large plants could process a maximum of about 6,000, 9,000, and 12,000 bales, respectively, during a normal ginning season without storage. However, ginning costs for each of the 3 gin sizes were estimated for seasonal volumes ranging from 2,000 bales less than maximum capacity without storage to 5,000 bales above maximum capacity, attainable with storage, at 1,000-bale intervals.

These estimates illustrate the effects of plant size, in terms of hourly ginning rate, and seasonal volume on ginning costs per bale. For example, the all-area average cost of ginning per bale for a typical small plant declined from \$16.07 for 4,000 bales to \$11.17 for 11,000 bales (table 7). For a medium-size plant, ginning costs per bale ranged from \$13.67 for 7,000 bales to \$10.94 for 14,000 bales (table 8). For the large firm, ginning costs per bale ranged from \$12.50 for 10,000 bales to \$10.73 for a seasonal volume of 17,000 bales (table 9). The decline in ginning costs per bale as seasonal volume increased resulted primarily from the greater use of the gin plant and spreading of total fixed cost over a larger output.

For a given seasonal volume, ginning costs per bale increased as the size of the plant was increased. For a seasonal volume of 10,000 bales, ginning costs per bale averaged \$11.43 for the small plant, \$12.02 for the medium-size plant, and \$12.50 for the large plant (fig. 1). This greater cost was due to the larger investment in gin plant that was necessary to provide the greater hourly capacity. This increased the fixed ginning cost per bale for the larger gin, and more than offset the slight reduction in ginning cost per bale that might have resulted from more efficient use of some variable inputs.

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<sup>4/</sup> The assumed rated capacities of 8, 12, and 16 bales an hour correspond to manufacturers' ratings of maximum capacity under optimum operating conditions.



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Figure 1.--Relationships of seasonal ginning volume and rated hourly ginning capacity to ginning costs per bale, average 3 study areas, 1962-63

#### Total Costs of Storing-Ginning

The investment in seed-cotton storage facilities increases fixed costs of the gin firm in the same manner as an investment in gin buildings, gin stands, or other gin machinery. Fixed costs resulting from this investment, once it has been made, must be paid whether or not the storage facility is used and regardless of the total seasonal ginning volume. For example, fixed costs of providing portable basket storage of 1,000-bale capacity increase the total annual costs of the firm by \$5,110 for all volumes of seasonal output up to the maximum attainable (tables 10, 11, and 12). Annual fixed costs, and thus total costs of the firm, are increased by about \$19,750 for a storage facility with 5,000 bales capacity.

Variable costs of storing seed cotton also increase total annual costs of the firm. Variable costs for storing seed cotton equivalent to 1,000 bales of lint increase total annual costs by about \$1,140; storing the equivalent of 5,000 bales increases total costs by \$5,200 (tables 10, 11, and 12). Unlike fixed costs for providing seed-cotton storage facilities, variable costs for storing do not have to be paid unless the storage facility is actually used. Thus, these costs are not incurred for seasonal volumes attainable without storage.

Increases in total costs of these magnitudes appreciably increase per bale costs for all volumes of seasonal output. For example, the per bale cost for the small plant with a seasonal volume of 6,000 bales attainable without storage

is \$13.47 (table 10). Providing and using portable basket storage of 1,000-bale capacity, and thus increasing seasonal volume to 7,000 bales, increases per bale costs to \$13.67. As additional storage capacity is added and fully utilized, thereby increasing seasonal volume, per bale costs for the small plant gradually decline. However, almost 5,000 bales must be stored, which results in a seasonal volume of about 11,000 bales, before the cost drops below the per bale cost of \$13.47 for the seasonal output of 6,000 bales achieved without storage (fig. 2).

Adding and using storage also results in higher per bale costs for the medium and large plants (fig. 3). For the medium plant, per bale cost averaged \$12.44 at a seasonal volume of 9,000 bales achieved without storage (table 11). At a seasonal volume of 14,000 bales, achieved by storing 5,000 bales, per bale costs averaged \$12.72. For the large plant, the increase in per bale costs was from \$11.78 at a volume of 12,000 bales without storage, to \$12.20 for a seasonal volume of 17,000 bales attained by storing 5,000 bales (table 12).

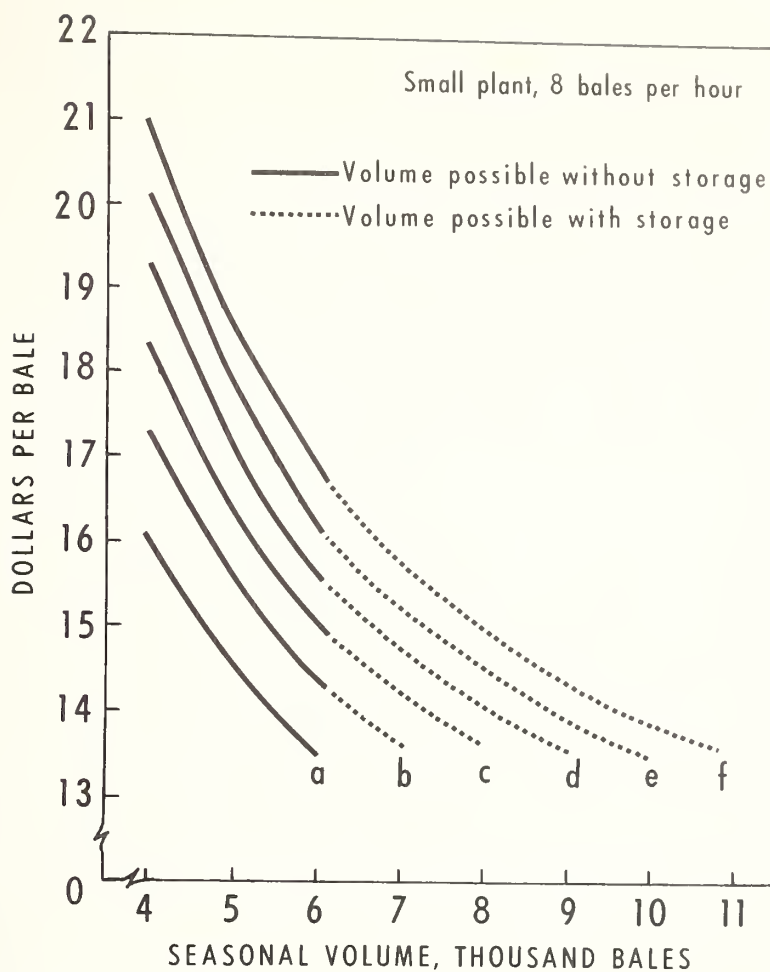
The decision whether or not to incorporate storage facilities with a ginning operation should be based on a very thorough and accurate appraisal of immediate and long-run prospects of potential volume. Providing storage capacity which, for some reason, is not utilized greatly increases the per bale cost for those seasonal volumes that could have been received and processed without storage. For example, at the small plant, per bale cost for a seasonal volume of 6,000 bales achieved without storage averaged \$13.47. In comparison, for the same seasonal output, per bale cost would have averaged \$14.32, if storage of 1,000-bale capacity had been provided but not utilized (table 10).

Providing more storage capacity than is actually needed or can be used also increases per bale costs. If storage for 3,000 bales is provided at the small plant, but only 1,000 bales are stored, resulting in a seasonal volume of 7,000 bales, per bale costs will average \$14.79. In comparison, if storage for only 1,000 bales had been provided, per bale cost would have been only \$13.67.

### Cost Comparisons

Some direct-cost comparisons emphasize the importance of considering the effects of all costs associated with providing and using seed-cotton storage on the total costs of the firm. For a seasonal volume of 7,000 bales, the per bale cost of storing-ginning for the small plant with 1,000 bales of seed cotton storage capacity is identical with the per bale cost of ginning for the medium-size plant without storage (fig. 4). For a seasonal volume of 8,000 bales, the per bale cost of storing-ginning for the small plant with 2,000 bales of storage capacity is equal to the per bale cost of ginning for the large plant without storage. This indicates a cost advantage favoring the medium-size gin over the small gin with storage at seasonal volumes exceeding 7,000 bales, and a cost advantage favoring the large plant over the small plant with storage for seasonal volumes greater than 8,000 bales.

If portable basket storage of 2,000-bale capacity is added at the small gin, providing a maximum seasonal volume of 8,000 bales, the storing-ginning cost will exceed ginning costs of the medium-size gin at all outputs within an applicable



a - no storage

b - 1,000-bale storage

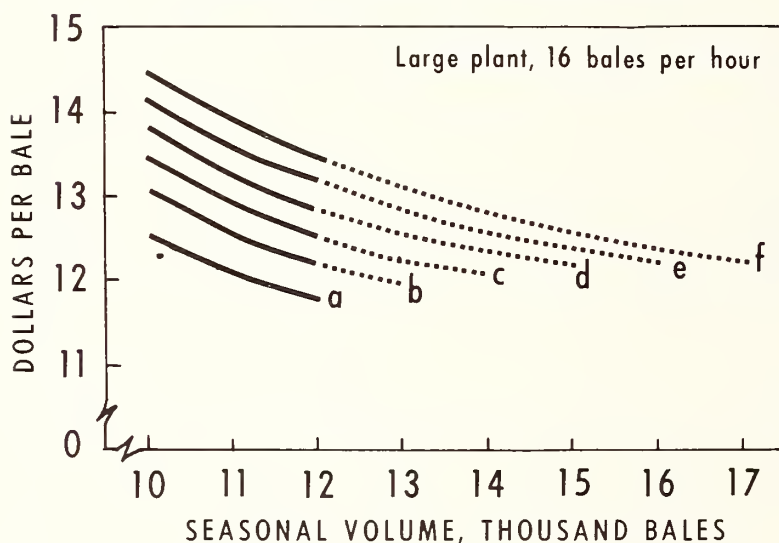
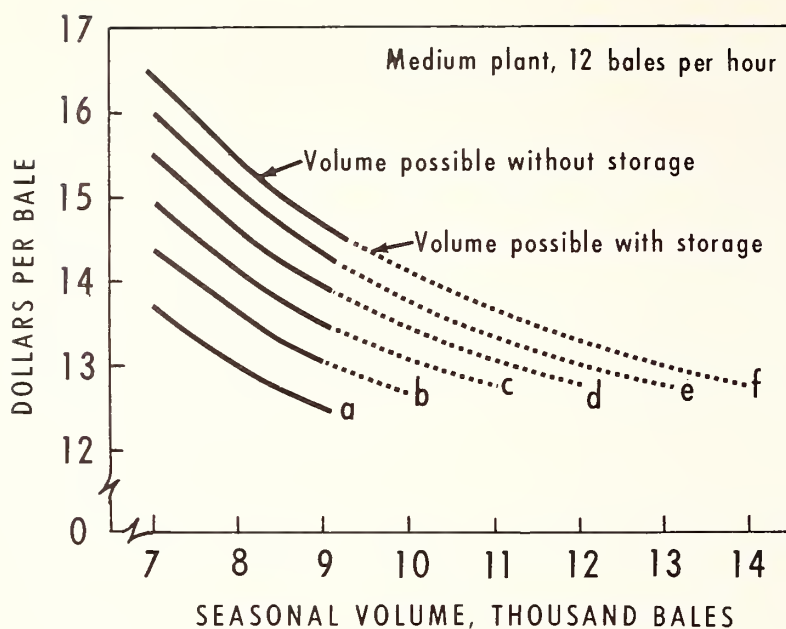
c - 2,000-bale storage

d - 3,000-bale storage

e - 4,000-bale storage

f - 5,000-bale storage

Figure 2.--Effects of providing and using portable basket seed-cotton storage facilities of various capacities on per bale costs of typical small ginning firms, average of 3 study areas, 1962-63

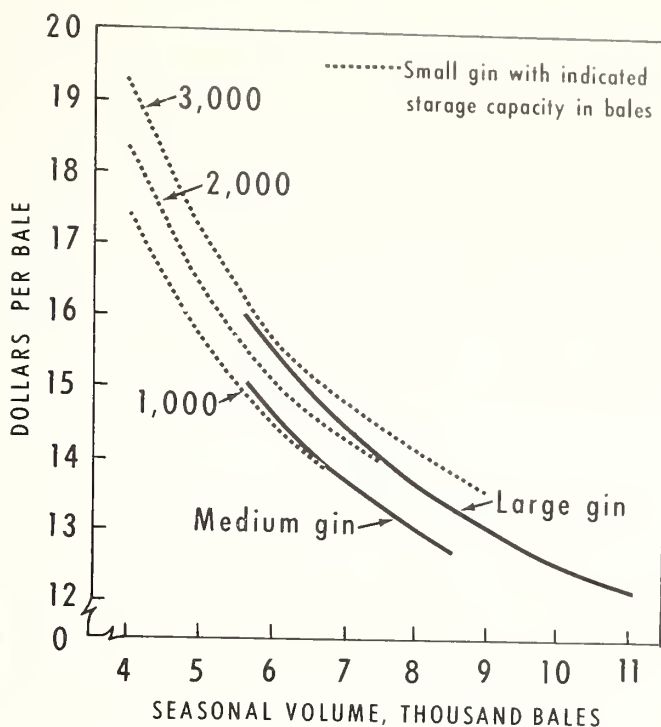


a - no storage	d - 3,000-bale storage
b - 1,000-bale storage	e - 4,000-bale storage
c - 2,000-bale storage	f - 5,000-bale storage

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Figure 3.--Effects of providing and using portable basket seed-cotton storage facilities of various capacities on per bale costs of typical medium and large ginning firms, average 3 study areas, 1962-63



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Figure 4.--Relationships of volumes and costs for a small gin with seed-cotton storage capacity of 1,000, 2,000, and 3,000 bales compared with a medium and a large gin without storage, average 3 study areas, 1962-63

range of comparability. Likewise, a 3,000-bale or larger storage facility added to the small plant will result in storing-ginning costs that are higher than ginning costs for the large plant at all applicable outputs.

From these comparisons, it would appear that adding up to a maximum of 1,000 bales of storage at the small gin can be justified only if the anticipated seasonal volume is not expected to exceed 7,000 bales. If prospects are good for a larger volume, replacing this gin with one of greater capacity, or some other alternative, should be considered.

#### ALTERNATIVES TO STORING SEED COTTON

In areas of production where rate of harvest has increased to such an extent that the gin can no longer keep up, the ginner has the alternative, in addition to storing seed cotton, of increasing the unloading rate of his plant by increasing the rate of ginning. This may be accomplished by modernizing the present gin plant, constructing an additional gin, or replacing the existing plant with one of greater capacity.

Effective capacity of many plants can be increased by 500 to 1,000 bales annually by improving operating efficiency and by relatively inexpensive alterations to modernize the gin. In many instances, a ginner can increase the

unloading and ginning rate of his gin substantially by rearranging seed cotton cleaning and drying systems, installing an automatic feeder, increasing capacity of the unloading fan and automatic feeder, or by adopting more efficient operating practices.

Elimination of a bottleneck in the seed-cotton handling system may be accomplished in some plants by replacing only one machine. This would increase capacity by improving efficiency of existing stands, or by making it possible to efficiently feed an additional stand. If seed-cotton receipts exceed the increased capacity attainable through these means, more elaborate alterations, such as the installation of higher capacity stands, may be required.

If the present plant is already operating at or near peak efficiency, and is well designed so that capacity cannot be increased by relatively minor alterations, it may be advisable to build an additional plant. The new gin can be located either adjacent to the old plant, or at a new site. Locating the new plant on the same gin yard may result in some savings in labor, office, and managerial expenses. However, locating the new gin at a different site may result in greater increases in seasonal volume which will further justify choosing this alternative.

If the existing plant is completely inadequate, or inefficient, because of obsolescence or wear, the most practicable solution to the problem of insufficient capacity may well be its replacement with a new plant of greater capacity capable of handling the expected volume as it is harvested. Any individual machines or motors from the old gin, of good design and in serviceable condition, can be incorporated into the new plant, thereby reducing total investment costs. Replacing the old gin with a new plant may offer the advantage of having the operation entirely at one location, as well as providing the operating efficiency characteristic of new gin machinery.

#### GUIDE FOR EVALUATING ALTERNATIVES

When a ginner is faced with the handling and unloading of seed cotton in excess of his plant's ginning capacity, he needs some guide for determining whether he should provide seed-cotton storage facilities or adjust his ginning rate more closely to the harvesting rate by some other means. The use of a cost factor based on the annual cost per dollar invested in gin plant and equipment provides such a guide. Although individual cost items vary between areas, a derived estimate of annual fixed costs for each dollar of capital invested in a gin plant would average approximately 9 cents. This cost estimate was derived as follows:

<u>Item</u>	<u>Cost</u>
Depreciation (5 percent).....	\$0.0500
Interest on investment (5 percent of average value).....	0.0250
Insurance on equipment.....	0.0072
Taxes.....	<u>0.0078</u>
Total cost factor.....	\$0.0900

As previously indicated, the average annual fixed costs of storing seed cotton in portable baskets was estimated at \$5,110 for 1,000 bales; \$9,160 for 2,000 bales; and \$12,900 for 3,000 bales. Dividing these annual fixed cost estimates by the cost factor of 9 cents gives \$56,778, \$101,778, and \$143,333, respectively. Thus, annual fixed costs resulting from an investment of \$56,778 to modernize the gin plant and increase the ginning rate approximates annual fixed costs of providing portable basket storage of 1,000-bale capacity.

If the increase in ginning rate is sufficient to handle an additional 1,000 bales during the normal season, and can be achieved for less than \$56,778, it will be more economical to modernize the plant than to invest in storage facilities. However, if an investment of more than \$56,778 is required to increase the ginning rate sufficiently to handle the added volume, then the installation of basket storage of 1,000-bale capacity is preferable. Similarly, annual fixed costs resulting from investments of \$101,778 and \$143,333 to modernize plants adequately to handle an additional 2,000 and 3,000 bales, respectively, are equal to annual fixed costs of providing storage of equal capacities. These investment figures will be higher if the cost of insuring stored seed cotton is added to the cost of storage.

In addition to comparing annual fixed costs of plant modernization with those of providing storage facilities, thorough consideration should also be given to the annual variable costs of the alternatives. Providing basket storage for 1,000, 2,000, and 3,000 bales increases annual variable costs of the firm by \$1,140, \$2,200, and \$3,240, respectively. However, as a result of plant modernization, more power, labor, and other variable inputs may be required; their effects on the firm's total costs should be carefully evaluated.

An analysis of each plant is necessary to determine whether the desired increase in ginning rate can be accomplished within these cost limits. In some plants, the necessary capital investment to achieve the desired increase in ginning capacity may be much less than these estimates. Extensive alterations can be made in many plants with an expenditure of \$57,000 to \$102,000, and \$143,000 represents a large portion of the investment needed to build a new gin with a maximum capacity of 7 to 8 bales an hour. The decision then will be governed by the extent to which the plant will need to be altered and the likelihood of volume remaining at the anticipated level.

# APPENDIX

Table 1.--Estimated investment cost of facilities for storing seed cotton in portable baskets on gin yard, by storage capacity, 1963-64

Item	Cost for storage capacities of-- 1/					
	500	1,000	2,000	3,000	4,000	5,000
	bales	bales	bales	bales	bales	bales
	Dollars					
Land.....	2,200	3,200	5,100	6,600	8,100	9,600
Basket.....	15,000	28,700	55,600	80,500	104,600	127,500
Sheds.....	7,500	14,800	29,500	42,900	56,300	69,500
Unloading station...	6,000	6,000	6,000	6,000	6,000	6,000
Lifts.....	2,000	2,000	2,000	4,000	4,000	4,000
Tractors.....	1,400	1,400	2,800	2,800	2,800	2,800
Total investment..	34,100	56,100	101,000	142,800	181,100	219,400

1/ Capacity required for seed cotton to yield specified number of 500-pound bales of ginned lint.

Table 2.--Estimated average cost per bale to store seed cotton on farm in single-use, bulk-type storage facility in the Midsouth, by storage capacity, 1963-64

Item 1/	Cost per bale for storing--					
	500	1,000	2,000	3,000	4,000	5,000
	bales	bales	bales	bales	bales	bales
	Dollars					
Depreciation 2/.....	0.87	0.79	0.76	0.72	0.68	0.65
Interest on investment 3/.....	.64	.59	.57	.54	.51	.49
Insurance.....	.38	.35	.33	.32	.32	.29
Taxes.....	.13	.12	.11	.11	.10	.10
Total fixed costs.....	2.02	1.85	1.77	1.69	1.61	1.53
Labor (\$1.25 per hour).....	2.35	2.25	2.23	2.20	2.18	2.15
Tractor fuel.....	.23	.22	.22	.21	.20	.20
Miscellaneous.....	.55	.52	.51	.51	.50	.50
Total variable costs 4/.....	3.13	2.99	2.96	2.92	2.88	2.85
Total.....	5.15	4.84	4.73	4.61	4.49	4.38

1/ Costs based on usage to full capacity one time during the season with no alternative use of storage facilities.

2/ Depreciation figured at 3.33 percent on buildings and 5 percent on equipment.

3/ Interest on investment figured at 5 percent on land and 2.5 percent on investment in buildings and equipment.

4/ Does not include insurance on seed cotton because of wide variations in type and cost of coverage within and between areas.

Table 3.--Estimated investment cost of fully enclosed, bulk-type seed-cotton storage facilities on gin yard, by storage capacity, 1963-64

Item	Cost for storage capacities of-- <u>1/</u>					
	500	1,000	2,000	3,000	4,000	5,000
	bales	bales	bales	bales	bales	bales
	----- Dollars -----					
Land.....	400	800	1,600	2,400	3,150	3,500
Building <u>2/</u> .....	13,750	25,000	47,700	70,000	92,500	115,000
Equipment <u>3/</u> .....	10,000	12,000	24,000	35,000	45,200	55,000
Total investment...	24,150	37,800	73,300	107,400	140,850	173,500

1/ Capacity required for seed cotton to yield specified number of 500-pound bales of ginned lint.

2/ Buildings are constructed of metal frames, siding, and roofing, with concrete foundations and floors. Individual storage buildings are approximately 50 x 100 x 20 feet, with a maximum capacity of 500 bales. Thus, 10 buildings will be needed to provide 5,000-bale storage capacity.

3/ Permanently installed transfer equipment consisting of suction fan, separator, motor, piping, and valves installed adjacent to building for 500-bale storage, or between each pair of buildings for 1,000 bales or multiples thereof.

Table 4.--Estimated investment cost of on-farm seed-cotton storage facilities, by storage capacity, 1963-64 1/

Item	Cost for storage capacities of-- <u>2/</u>					
	500	1,000	2,000	3,000	4,000	5,000
	bales	bales	bales	bales	bales	bales
	----- Dollars -----					
Land.....	100	200	400	600	800	1,000
Buildings.....	11,360	22,000	42,200	60,000	75,500	90,000
Unloader <u>3/</u> .....	1,175	1,175	2,300	3,450	4,500	5,500
Total investment...	12,635	23,375	44,900	64,050	80,800	96,500

1/ These facilities are bulk type with open sides and dirt floors. They are made of all steel.

2/ Capacity required for seed cotton to yield specified number of 500-pound bales of ginned lint.

3/ Power to be provided by farm tractor not included in costs.

Table 5.--Estimated average cost per bale to store seed cotton in portable baskets on gin yard, by storage capacity and area of production, 1963-64

Area and cost item <u>1/</u>	Cost per bale for storing--					
	500	1,000	2,000	3,000	4,000	5,000
	bales	bales	bales	bales	bales	bales
	- - - - - Dollars - - - - -					
<u>Midsouth</u>						
Depreciation <u>2/</u> .....	3.53	2.82	2.52	2.38	2.26	2.17
Interest on investment <u>3/</u> ....	1.82	1.48	1.33	1.24	1.18	1.14
Insurance (facility).....	.46	.38	.34	.32	.31	.30
Taxes.....	.34	.28	.25	.24	.23	.22
Total fixed costs.....	6.15	4.96	4.44	4.18	3.98	3.83
Labor (\$1.25 per hour).....	.46	.44	.42	.41	.41	.40
Power (4.4 kwh per bale).....	.14	.14	.13	.12	.12	.12
Miscellaneous.....	.55	.52	.51	.50	.50	.48
Total variable costs <u>4/</u> ....	1.15	1.10	1.06	1.03	1.03	1.00
Total.....	7.30	6.06	5.50	5.21	5.01	4.83
<u>High Plains</u>						
Depreciation <u>2/</u> .....	3.53	2.82	2.52	2.38	2.26	2.17
Interest on investment <u>3/</u> ....	1.82	1.48	1.33	1.24	1.18	1.14
Insurance (facility).....	.64	.53	.47	.45	.43	.42
Taxes.....	.22	.18	.16	.15	.15	.14
Total fixed costs.....	6.21	5.01	4.48	4.22	4.02	3.87
Labor (\$1.25 per hour).....	.46	.44	.42	.41	.41	.40
Power (4.4 kwh per bale).....	.11	.11	.10	.10	.10	.09
Miscellaneous.....	.55	.52	.51	.50	.50	.48
Total variable costs <u>4/</u> ....	1.12	1.07	1.03	1.01	1.01	.97
Total.....	7.33	6.08	5.51	5.23	5.03	4.84
<u>San Joaquin Valley</u>						
Depreciation <u>2/</u> .....	3.53	2.82	2.52	2.38	2.26	2.17
Interest on investment <u>3/</u> ....	1.82	1.48	1.33	1.24	1.18	1.14
Insurance (facility).....	.28	.23	.21	.20	.19	.18
Taxes.....	1.02	.84	.75	.70	.68	.66
Total fixed costs.....	6.65	5.37	4.81	4.52	4.31	4.15
Labor (\$1.90 per hour).....	.69	.66	.63	.63	.61	.60
Power (4.4 kwh per bale).....	.08	.08	.07	.07	.07	.06
Miscellaneous.....	.55	.52	.51	.51	.50	.48
Total variable costs <u>4/</u> ....	1.32	1.26	1.21	1.21	1.18	1.14
Total.....	7.97	6.62	6.02	5.71	5.49	5.29
<u>Average, three areas</u>						
Fixed costs.....	6.34	5.11	4.58	4.30	4.10	3.95
Variable costs <u>4/</u> .....	1.20	1.14	1.10	1.08	1.08	1.04
Total.....	7.54	6.25	5.68	5.38	5.18	4.99

1/ Costs based on usage to full capacity one time during the season, with no alternative use of storage facilities. 2/ Depreciation figured at 5 percent on baskets, sheds, and unloading station, and 10 percent on lifts and tractors. 3/ Interest on investment figured at 5 percent on land value and 2.5 percent on investment in equipment. 4/ Does not include insurance on seed cotton because of wide variations in types and cost of coverage within and between areas.

Table 6.--Estimated average cost per bale to store seed cotton on gin yard in single-use, bulk-type, fully enclosed storage facility, by storage capacity and area of production, 1963-64

Area and cost item <u>1/</u>	Cost per bale for storing--					
	500 bales	1,000 bales	2,000 bales	3,000 bales	4,000 bales	5,000 bales
	- - - - - Dollars - - - - -					
<u>Midsouth</u>						
Depreciation <u>2/</u> .....	1.92	1.43	1.39	1.36	1.34	1.32
Interest on investment <u>3/</u> ....	1.23	.96	.94	.92	.90	.88
Insurance (facility).....	.34	.27	.26	.25	.25	.24
Taxes.....	.24	.19	.18	.18	.17	.17
Total fixed costs.....	3.73	2.85	2.77	2.71	2.66	2.61
Labor (\$1.25 per hour).....	.85	.82	.81	.81	.79	.78
Power (12.5 kwh per bale)....	.41	.40	.40	.39	.38	.37
Miscellaneous.....	.55	.52	.51	.50	.49	.48
Total variable costs <u>4/</u> ....	1.81	1.74	1.72	1.70	1.66	1.63
Total.....	5.54	4.59	4.49	4.41	4.32	4.24
<u>High Plains</u>						
Depreciation <u>2/</u> .....	1.92	1.43	1.39	1.36	1.34	1.32
Interest on investment <u>3/</u> ....	1.23	.96	.94	.92	.90	.88
Insurance (facility).....	.48	.37	.36	.36	.35	.34
Taxes.....	.15	.12	.12	.12	.11	.11
Total fixed costs.....	3.78	2.88	2.81	2.76	2.70	2.65
Labor (\$1.25 per hour).....	.85	.82	.81	.80	.79	.78
Power (12.5 kwh per bale)....	.32	.31	.30	.29	.29	.28
Miscellaneous.....	.55	.52	.51	.50	.49	.48
Total variable costs <u>4/</u> ....	1.72	1.65	1.62	1.59	1.57	1.54
Total.....	5.50	4.53	4.43	4.35	4.27	4.19
<u>San Joaquin Valley</u>						
Depreciation <u>2/</u> .....	1.92	1.43	1.39	1.36	1.34	1.32
Interest on investment <u>3/</u> ....	1.23	.96	.94	.92	.90	.88
Insurance (facility).....	.21	.16	.16	.16	.15	.15
Taxes.....	.72	.57	.56	.55	.54	.52
Total fixed costs.....	4.08	3.12	3.05	2.99	2.93	2.87
Labor (\$1.90 per hour).....	1.28	1.23	1.21	1.20	1.18	1.17
Power (12.5 kwh per bale)....	.24	.23	.23	.22	.22	.21
Miscellaneous.....	.55	.52	.51	.50	.49	.48
Total variable costs <u>4/</u> ....	2.07	1.98	1.95	1.92	1.89	1.86
Total.....	6.15	5.10	5.00	4.91	4.82	4.73

1/ Costs based on usage to full capacity one time during the season, with no alternative use of storage facilities.

2/ Depreciation figured at 3.33 percent on buildings and 5 percent on equipment.

3/ Interest on investment figured at 5 percent on land and 2.5 percent on investment in buildings and equipment.

4/ Does not include insurance on seed cotton because of wide variations in type and cost of coverage within and between areas.

Table 7.--Estimated ginning cost per bale for a typical plant rated at 8 bales per hour, by seasonal volume and area of production, season 1962-63 1/

Area and type of cost	Ginning cost per bale for seasonal volume of-- <u>2/</u>									
	4,000 bales	5,000 bales	6,000 bales	7,000 bales	8,000 bales	9,000 bales	10,000 bales	11,000 bales		
<u>Midsouth</u>										
Fixed costs.....	5.86	4.75	4.01	3.48	3.08	2.77	2.52	2.32		
Variable costs.....	9.62	9.21	8.88	8.76	8.61	8.48	8.40	8.34		
Total.....	15.48	13.96	12.89	12.24	11.69	11.25	10.92	10.66		
<u>High Plains</u>										
Fixed costs.....	6.06	4.91	4.14	3.59	3.18	2.87	2.61	2.40		
Variable costs.....	10.16	9.75	9.51	9.35	9.22	9.10	9.01	8.95		
Total.....	16.22	14.66	13.65	12.94	12.40	11.97	11.62	11.35		
<u>San Joaquin Valley</u>										
Fixed costs.....	6.34	5.14	4.33	3.76	3.33	2.99	2.72	2.50		
Variable costs.....	10.16	9.80	9.54	9.40	9.25	9.12	9.04	9.00		
Total.....	16.50	14.94	13.87	13.16	12.58	12.11	11.76	11.50		
Average all areas.....	16.07	14.52	13.47	12.78	12.22	11.78	11.43	11.17		

1/ Assumed that plants rated at 8 bales per hour would average approximately 7 bales per hour during the season.

2/ Assumed that volumes up to 6,000 bales attainable during ginning season without seed-cotton storage; volumes exceeding 6,000 bales attainable only with seed-cotton storage.

Table 8.--Estimated ginning cost per bale for a typical plant rated at 12 bales per hour, by seasonal volume and area of production, season 1962-63 1/

Area and type of cost	Ginning cost per bale for seasonal volumes of-- 2/							
	7,000 : bales :	8,000 : bales :	9,000 : bales :	10,000 : bales :	11,000 : bales :	12,000 : bales :	13,000 : bales :	14,000 : bales :
<u>Midsouth</u>								
Fixed costs.....	4.50	3.97	3.56	3.24	2.97	2.75	2.56	2.40
Variable costs.....	8.62	8.49	8.37	8.30	8.24	8.19	8.16	8.12
Total.....	13.12	12.46	11.93	11.54	11.21	10.94	10.72	10.52
<u>High Plains</u>								
Fixed costs.....	4.66	4.11	3.69	3.36	3.08	2.85	2.65	2.49
Variable costs.....	9.17	9.04	8.93	8.84	8.77	8.72	8.67	8.63
Total.....	13.83	13.15	12.62	12.20	11.85	11.57	11.32	11.12
<u>San Joaquin Valley</u>								
Fixed costs.....	4.90	4.32	3.87	3.52	3.23	2.98	2.77	2.60
Variable costs.....	9.16	9.03	8.90	8.80	8.73	8.68	8.63	8.58
Total.....	14.06	13.35	12.77	12.32	11.96	11.66	11.40	11.18
Average all areas.....	13.67	12.99	12.44	12.02	11.67	11.39	11.14	10.94

1/ Assumed that plants rated at 12 bales per hour would average 10.2 bales per hour during the season.  
2/ Assumed that volumes up to 9,000 bales attainable during ginning season without seed-cotton storage; volumes exceeding 9,000 bales attainable only with seed-cotton storage.

Table 9.--Estimated ginning cost per bale for a typical plant rated at 16 bales per hour, by seasonal volume and area of production, season 1962-63 1/

Area and type of cost	Ginning cost per bale for seasonal volumes of-- <u>2/</u>									
	10,000 : bales :	11,000 : bales :	12,000 : bales :	13,000 : bales :	14,000 : bales :	15,000 : bales :	16,000 : bales :	17,000 : bales :		
<u>Midsouth</u>										
- - - - - Dollars - - - - -										
Fixed costs.....	3.87	3.54	3.28	3.04	2.85	2.68	2.53	2.40		
Variable costs.....	8.16	8.14	8.10	8.04	8.04	8.04	8.03	8.01		
Total.....	12.03	11.68	11.36	11.08	10.89	10.72	10.56	10.41		
<u>High Plains</u>										
Fixed costs.....	4.00	3.66	3.38	3.15	2.94	2.77	2.61	2.48		
Variable costs.....	8.68	8.60	8.54	8.48	8.45	8.41	8.39	8.36		
Total.....	12.68	12.26	11.92	11.63	11.39	11.18	11.00	10.84		
<u>San Joaquin Valley</u>										
Fixed costs.....	4.22	3.86	3.56	3.31	3.09	2.91	2.75	2.60		
Variable costs.....	8.58	8.52	8.49	8.46	8.39	8.36	8.34	8.33		
Total.....	12.80	12.38	12.06	11.77	11.48	11.27	11.09	10.93		
Average all areas.....	12.50	12.11	11.78	11.49	11.25	11.06	10.88	10.73		

1/ Assumed that plants rated at 16 bales per hour would average 13.6 bales per hour during the season.  
2/ Assumed that volumes up to 12,000 bales attainable during ginning season without seed-cotton storage; volumes exceeding 12,000 bales attainable only with seed-cotton storage.

Table 10.--Estimated total and per bale cost of storing seed cotton and ginning for a plant rated at 8 bales per hour, by storage capacity and seasonal volume attainable with and without storage, average of 3 study areas, 1962-63 1/

Capacity of storage added, and type of cost	Seasonal volume attainable									
	Without storage					With indicated storage capacity				
	4,000 bales	5,000 bales	6,000 bales	7,000 bales	8,000 bales	9,000 bales	10,000 bales	11,000 bales	12,000 bales	13,000 bales
No storage			Dollars							Dollars
Ginning.....	64,280	72,600	80,820							
Total.....	64,280	72,600	80,820							
Per bale.....	16.07	14.52	13.47							
1,000-bale storage										
Ginning.....	64,280	72,600	80,820	89,460						
Storing, fixed.....	5,110	5,110	5,110	5,110	5,110					
Storing, variable.....	---	---	---	1,140	1,140					
Total.....	69,390	77,710	85,930	95,710	99,760					
Per bale.....	17.35	15.54	14.32	13.67	12.47					
2,000-bale storage										
Ginning.....	64,280	72,600	80,820	89,460	97,760					
Storing, fixed.....	9,160	9,160	9,160	9,160	9,160					
Storing, variable.....	---	---	---	1,140	2,200					
Total.....	73,440	81,760	89,980	99,760	109,120					
Per bale.....	18.36	16.35	15.00	14.25	13.64					
3,000-bale storage										
Ginning.....	64,280	72,600	80,820	89,460	97,760	106,020				
Storing, fixed.....	12,900	12,900	12,900	12,900	12,900	12,900				
Storing, variable.....	---	---	---	1,140	2,200	3,240				
Total.....	77,180	85,500	93,720	103,500	112,860	122,160				
Per bale.....	19.30	17.10	15.62	14.79	14.11	13.57				
4,000-bale storage										
Ginning.....	64,280	72,600	80,820	89,460	97,760	106,020	114,300			
Storing, fixed.....	16,400	16,400	16,400	16,400	16,400	16,400	16,400			
Storing, variable.....	---	---	---	1,140	2,200	3,240	4,320			
Total.....	80,680	89,000	97,220	107,000	116,360	125,660	135,020			
Per bale.....	20.17	17.80	16.20	15.29	14.54	13.96	13.50			
5,000-bale storage										
Ginning.....	64,280	72,600	80,820	89,460	97,760	106,020	114,300	122,870		
Storing, fixed.....	19,750	19,750	19,750	19,750	19,750	19,750	19,750	19,750		
Storing, variable.....	---	---	---	1,140	2,200	3,240	4,320	5,200		
Total.....	84,030	92,350	100,570	110,350	119,710	129,010	138,370	147,820		
Per bale.....	21.01	18.47	16.76	15.76	14.96	14.33	13.84	13.44		

1/ Total ginning costs computed from estimated per bale costs summarized in table 7. Fixed and variable costs of storing seed cotton computed from per bale costs summarized in table 4.

Table 11.--Estimated total and per bale cost of storing seed cotton and ginning for a plant rated at 12 bales per hour, by storage capacity and seasonal volume attainable with and without storage, average of 3 study areas, 1962-63 1/

Capacity of storage added, and type of cost	Seasonal volume attainable											
	Without storage				With indicated storage capacity							
	7,000 bales	8,000 bales	9,000 bales	10,000 bales	11,000 bales	12,000 bales	13,000 bales	14,000 bales	15,000 bales	16,000 bales	17,000 bales	18,000 bales
No storage												
Ginning.....	95,690	103,920	111,960									
Total.....	95,690	103,920	111,960									
Per bale.....	13.67	12.99	12.44									
1,000-bale storage												
Ginning.....	95,690	103,920	111,960	120,200								
Storing, fixed.....	5,110	5,110	5,110	5,110								
Storing, variable.....	--	--	--	1,140								
Total.....	100,800	109,030	117,070	126,450								
Per bale.....	14.40	13.63	13.01	12.64								
2,000-bale storage												
Ginning.....	95,690	103,920	111,960	120,200	128,370							
Storing, fixed.....	9,160	9,160	9,160	9,160	9,160							
Storing, variable.....	--	--	--	1,140	2,200							
Total.....	104,850	113,080	121,120	130,500	139,730							
Per bale.....	14.98	14.14	13.46	13.05	12.70							
3,000-bale storage												
Ginning.....	95,690	103,920	111,960	120,200	128,370	136,680						
Storing, fixed.....	12,900	12,900	12,900	12,900	12,900	12,900						
Storing, variable.....	--	--	--	1,140	2,200	3,240						
Total.....	108,590	116,820	124,860	134,240	143,470	152,820						
Per bale.....	15.51	14.60	13.87	13.42	13.04	12.73						
4,000-bale storage												
Ginning.....	95,690	103,920	111,960	120,200	128,370	136,680	144,820					
Storing, fixed.....	16,400	16,400	16,400	16,400	16,400	16,400	16,400					
Storing, variable.....	--	--	--	1,140	2,200	3,240	4,320					
Total.....	112,090	120,320	128,360	137,740	146,970	156,320	165,540					
Per bale.....	16.01	15.04	14.26	13.77	13.36	13.03	12.73					
5,000-bale storage												
Ginning.....	95,690	103,920	111,960	120,200	128,370	136,680	144,820	153,160				
Storing, fixed.....	19,750	19,750	19,750	19,750	19,750	19,750	19,750	19,750				
Storing, variable.....	--	--	--	1,140	2,200	3,240	4,320	5,200				
Total.....	115,440	123,670	131,710	141,090	150,320	159,670	168,890	178,110				
Per bale.....	16.49	15.46	14.63	14.11	13.67	13.31	12.99	12.72				

1/ Total ginning costs computed from estimated per bale costs summarized in table 8. Fixed and variable costs of storing seed cotton computed from per bale costs summarized in table 4.

Table 12.--Estimated total and per bale cost of storing seed cotton and ginning for a plant rated at 16 bales per hour, by storage capacity and seasonal volume attainable with and without storage, average of 3 study areas, 1962-63 1/

Capacity of storage added, and type of cost	Seasonal volume attainable									
	Without storage					With indicated storage capacity				
	10,000 bales	11,000 bales	12,000 bales	13,000 bales	14,000 bales	15,000 bales	16,000 bales	17,000 bales	18,000 bales	19,000 bales
<u>No storage</u>										
Ginning.....										
Total.....	125,000	133,210	141,360							
Per bale.....	125,000	133,210	141,360							
1,000-bale storage										
Ginning.....	125,000	133,210	141,360	149,370						
Storing, fixed.....	5,110	5,110	5,110	5,110						
Storing, variable.....	--	--	--	1,140						
Total.....	130,110	138,320	146,470	155,620						
Per bale.....	13.01	12.58	12.21	11.97						
2,000-bale storage										
Ginning.....	125,000	133,210	141,360	149,370	157,500					
Storing, fixed.....	9,160	9,160	9,160	9,160	9,160					
Storing, variable.....	--	--	--	1,140	2,200					
Total.....	134,160	142,370	150,520	159,670	168,860					
Per bale.....	13.42	12.94	12.54	12.28	12.06					
3,000-bale storage										
Ginning.....	125,000	133,210	141,360	149,370	157,500	165,900				
Storing, fixed.....	12,900	12,900	12,900	12,900	12,900	12,900				
Storing, variable.....	--	--	--	1,140	2,200	3,240				
Total.....	137,900	146,110	154,260	163,410	172,600	182,040				
Per bale.....	13.79	13.28	12.86	12.57	12.33	12.14				
4,000-bale storage										
Ginning.....	125,000	133,210	141,360	149,370	157,500	165,900	174,080			
Storing, fixed.....	16,400	16,400	16,400	16,400	16,400	16,400	16,400			
Storing, variable.....	--	--	--	1,140	2,200	3,240	4,320			
Total.....	141,400	149,610	157,760	166,910	176,100	185,540	194,800			
Per bale.....	14.14	13.60	13.15	12.84	12.58	12.37	12.18			
5,000-bale storage										
Ginning.....	125,000	133,210	141,360	149,370	157,500	165,900	174,080	182,410		
Storing, fixed.....	19,750	19,750	19,750	19,750	19,750	19,750	19,750	19,750		
Storing, variable.....	--	--	--	1,140	2,200	3,240	4,320	5,200		
Total.....	144,750	152,960	161,110	170,260	179,450	188,890	198,150	207,360		
Per bale.....	14.48	13.91	13.43	13.10	12.82	12.59	12.38	12.20		

1/ Total ginning costs computed from estimated per bale costs summarized in table 9. Fixed and variable costs of storing seed cotton computed from per bale costs summarized in table 4.

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